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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,119	09/09/2003	Kazutaka Akiyama	09108.0003	9224

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Finnegan, Henderson, Farabow,  
Garrett & Dunner, L.L.P.  
1300 I Street, N.W.  
Washington, DC 20005-3315

EXAMINER

CAO, PHAT X

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/657,119

Applicant(s)

AKIYAMA, KAZUTAKA

Examiner

Phat X. Cao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-12 is/are rejected.
- 7) ☒ Claim(s) 3-5,13 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/19/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I, claims 1-14 in the reply filed on 11/9/04 is acknowledged.

***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The disclosure is objected to because of the following informalities:

On page 3, line 34, "d vice" should be changed to "device";

On page 4, line 1, "interlay r" should be changed to "interlayer";

line 34, "planariz d" should be changed to "planarized";

line 35, "exempl " should be changed to "example";

On page 7, line 1, "stack d" should be changed to "stacked";

line 1, "pattern d" should be changed to "patterned";

line 36, "expos " should be changed to "expose";

On page 8, line 2, "th" should be changed to "the";

line 33, "th" should be changed to "the";

line 34, "conn cting" should be changed to "connecting";

On page 9, line 34, " xc pt" should be changed to "except";

line 34, "ar" should be changed to "are";

line 34, "st p" should be changed to "stop";

line 35, "th interlay r" should be changed to "the interlayer";

line 35, "cov ring" should be changed to "covering";

On page 10, line 1, "Wh n" should be changed to "When";

line 2, "m chanical" should be changed to "mechanical";

line 2, " pplied" should be changed to "applied";

line 2, "th" should be changed to "the";

line 33, "empl ying" should be changed to "employing";

line 36, "abov –d scribed mbodiment" should be changed to  
"above-described embodiment";

On page 11, line 2, "prev nt" should be changed to "prevent";

line 2, "may b " should be changed to "may be";

line 34, "sam as" should be changed to "same as";

line 34, "t st waf r" should be changed to "test wafer";

line 35, "Experim ntal" should be changed to "Experimental";

line 35, "Exp rimental" should be changed to "Experimental";

On page 12, line 1, "wer" should be changed to "were".

Appropriate correction is required.

### ***Claim Objections***

4. Claims 5 and 7 are objected to because of the following informalities:

In claim 5, line 3, "cupper" should be changed to "copper";

In claim 7, line 3, "said s cond" should be changed to "said second".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-2, 10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Ogawa et al (US. 6,784,474).

Regarding claim 1, Ogawa (Fig. 4) discloses a semiconductor device comprising: a semiconductor substrate 10; a first wiring 24 formed above the semiconductor substrate 10 with a first insulating film 11 interposed therebetween; a MIM capacitor MC formed above the first insulating film; a second insulating film 22/41 formed to cover the MIM capacitor; a second wiring 42 formed on the second insulating film 22/41; and a guard ring 40 (also see Fig. 1B) buried in the second insulating film to surround the MIM capacitor.

Regarding claim 2, Ogawa (Fig. 4) further discloses that the second wiring 42 is connected to the first wiring 24 via a hole 30C formed in the second insulating film 22/41.

Regarding claim 10, because the MIM capacitor is completely surrounded by the guard ring 40 (see Fig. 1B), the guard ring 40 would inherently cut a seam generated in the second insulating film around the MIM capacitor.

Regarding claim 12, Ogawa (Fig. 4) further discloses a block insulating film 18 formed between the first insulating film 11 and the second insulating film 22/41 to cover the first wiring 24.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa et al (US. 6,784,474) in view of Nguyen et al (US. 2004/0092095).

Regarding claims 6-9, Ogawa does not disclose the second insulating film made of materials and having dielectric constant as claimed.

However, Nguyen (Fig. 1E) teaches the forming of an insulating film 104 surrounding an interconnect and made of materials including fluorine containing silicon oxide (FSG), carbon containing silicon oxide (SiOC), or porous silicon oxide (par. [0023]). Accordingly, it would have been obvious to form the second insulating film of

Ogawa with the materials as set forth above because these dielectric materials having a very low dielectric constant, such as less than about 3, as taught by Nguyen (par. [0023]).

***Allowable Subject Matter***

9. Claims 3-5 and 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- regarding claims 3-5, the prior of record fails to disclose the guard ring formed of the same material as the second wiring and the guard ring penetrating through the second insulating film.

- regarding claims 13-14, the prior art of record fails to disclose a third wiring formed on the third insulating film to connect at least one of the first and second wirings to the MIM capacitor.

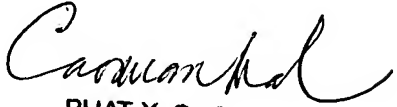
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (571) 272-1703. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PC  
February 3, 2005

  
PHAT X. CAO  
PRIMARY EXAMINER